

IN THE

# United States Circuit Court,

NORTHERN DISTRICT OF ILLINOIS.

IN EQUITY.

PULLMAN'S PALACE CAR CO.

VS.

WAGNER PALACE CAR CO. AND THE  
LAKE SHORE & MICHIGAN SOUTH-  
ERN RAILWAY CO.

Motion for Injunction  
*pendente lite.*

Abstract of Points taken in the Closing Argument  
on the Motion by B. F. Thurston.

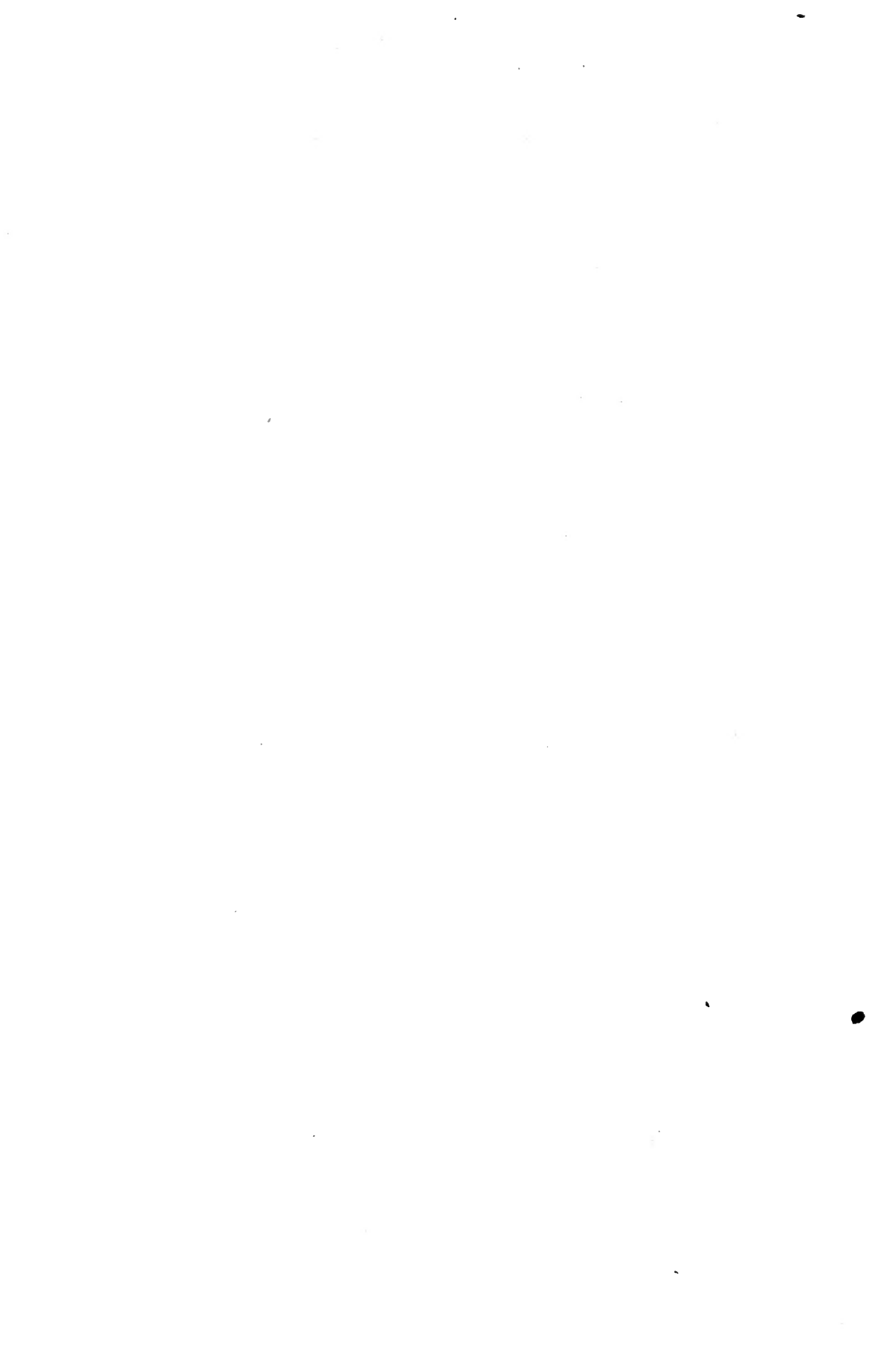
OFFIELD & TOWLE,

SOLICITORS FOR COMPLAINANT.

B. F. THURSTON,  
OF COUNSEL.

1888.

BARNARD & GUNTROP, LEGAL PRINTERS, 44 & 46 LASALLE ST., CHICAGO.



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MAY IT PLEASE YOUR HONORS:

This is a motion for an injunction pending the progress of the cause to final hearing.

I am aware that the complainants are bound to place themselves within the requirements of the court in such cases. I recognize that they must show a *prima facie* title to the invention, the validity of which is not seriously impeached. The seriousness of the impeachment, however, is not measured by the earnestness of the attack which the defendants may make, but by the sufficiency of such attack to raise a reasonable doubt as to the validity of the subject-matter of the patent. I recognize, too, that

it is the duty of the complainants to satisfy the court that there has been an infringement committed on the part of the defendants.

The present case, while it is peculiar in the circumstances that the Sessions patent is of recent date, is also more peculiar in the circumstance that the infringement which the defendants have committed has been most open, determined and flagrant. I humbly submit that the conduct of the defendants in appropriating for their own benefit every feature of improvement which the Pullman vestibuled train exhibits, should properly induce the court to exercise its power to prevent a further continuance of the wrong in case it shall be found that the Sessions patent covers any legal subject of invention whatever. This proposition leads me to ask your Honors to consider for a single moment what is the theory of the law with respect to issuing the preventive writ of injunction pending the hearing of a cause. As I understand the theory of the writ, which it is purely within the discretion of the chancellor to grant or refuse according to the circumstances of the particular case, its object is to preserve the existing state of titles to properties as they were at the commencement of the controversy. It is indispensable that the party seeking the writ shall have a title to the invention which he asserts by his patent which is not open to serious doubt or question. It is also indispensable that the invention should have been substantially appropriated by the defendant. The purpose of the writ being essentially to preserve titles *in statu quo*, it is proper to regard the particular circumstances which surround each application. The present case is not the ordinary one where a defendant has manufactured an apparatus or machine under the authority of letters patent of his own,

professing to contain an improvement which has resulted from his own effort and study, notwithstanding that it may trench upon the prior title of another; it is an instance where there has been, from the commencement of the exhibition to the public of the Pullman vestibuled train, a determined and deliberate appropriation of every substantial feature of construction, whether patentable or non-patentable, which such train exhibited. True, the defendants were not advised, because the patent had not then issued, what was the specific improvement which had been added to the general vestibule construction by Mr. Sessions, but the train which contained such improvement was in regular service, and the defendants were quite competent to understand and appreciate that the feature of uniting the ends of two cars by means of heavy metallic frame-plates backed by springs, and thus causing a vertical spring buffer to be interposed between the superstructures of cars, whereby the frictional surfaces of such frame-plates under opposing spring pressures would operate to check the tendency of the cars to oscillate or sway when in motion, was an extraordinary novelty in train construction.

In view of the attending circumstances set forth in the affidavit of Mr. Pullman, where he refers to the visit of Mr. Webb to him to solicit a license, the passage in the affidavit of Mr. Webb reads strangely where he says that owing "to the earnest desire of said Wagner Company "to avoid all possible controversy or ill feeling, it was "finally concluded that it was wiser to obtain a license from "said Pullman's Company under any and all patents that "might thereafter be obtained by it on vestibuled cars, "provided such license could be obtained for a very small or "nominal consideration." Prior to the time of this interview,

the Wagner Company had caused one or more of its constructors and draughtsmen to travel upon the Pullman train for the purpose of making drawings and sketches of the vestibule construction, and for the purpose of appropriating the improvement to the use of the company without any regard to whether there was any patent property existing in it or not. At the date of this interview between Mr. Webb and Mr. Pullman the defendants were actually engaged in adding to their cars—some of which had been built for them by the Pullman Company—the vestibule addition.

Further comment as to the extent to which the defendants have appropriated every mechanical idea which is contained in the Pullman train is rendered unnecessary, from the fact that we have placed before this court an exact duplicate in miniature of both the Pullman and the Wagner trains. When placed side by side these trains cannot be distinguished from each other. The defendants have copied not only the mechanical features of construction, but also those characteristics of form and proportion which have made the Pullman vestibuled train a startling individuality.

The outrage which has been committed by the Wagner Company is certainly unparalleled in the history of wilful appropriation of the product of study and thought on the part of another. Even if there were no patent property at all resident in the vestibule structure, it must be conceded that the merit which belongs to this confessedly great improvement in train construction is due to the Pullman Company, and the taking possession of it bodily by the defendants comes very close to that class of cases which courts of equity condemn as invasions of trade properties. If, however, there exists in the vestibule

organization a feature of mechanical construction which is properly the subject of letters patent, the court, I submit, under the extraordinary circumstances of this case, ought to regard such patent property with most favorable consideration, and protect the complainant to the extent of that ability which a court of chancery exercising a sound discretion to prevent wrong-doing can appropriately exert.

Upon applications for a preliminary injunction it is always of advantage for the parties seeking the writ to show that there has been an acquiescence on the part of the public for a considerable period of time in the validity of the claim to the patent property which he asserts. Manifestly, it is not indispensable that there should be a long period of acquiescence as a condition of the granting of the writ. Where the fact exists it is an aid to the plaintiff's equity, for the reason that it is corroborative of the assertion that he holds a valid title. The Sessions patent was granted on the 15th of November, 1887. It was applied for in April preceding, or about the time when the first completely equipped train was put into service on the Pennsylvania road. If by acquiescence is meant appreciation on the part of the public and an open recognition of novelty and merit in its construction, then there has been a degree of recognition almost unexampled in the history of inventions on the part of the general public. The law cannot be so unreasonable as to require as a condition to the protection of an inventor that no rival in business shall have deliberately pirated the invention. It is true that the plaintiff and the defendant companies are the two parties who are equipping railroads with sleeping and parlor car accommodations, and therefore the body of persons who are to exhibit acquiescence in a

patented property, in the sense of refraining from trespassing upon it, are limited practically to the defendant company. On the part of this defendant there has been the highest evidence of acquiescence in the value of the improvement, from the fact that it has appropriated it, and from the further fact (belittled as it is now sought to be) that it became alarmed at the possible consequences of its own meditated conduct, and sought to obtain a license. I concede that at the time of this application for a license it was not advised precisely what subject of claim would be embraced in one or more patents relating to the vestibule construction, but the defendants well knew that there were frame-plates forming part of such vestibule, and that the plates of adjacent cars, when coupled, bore against each other under frictional contact; and while indeed it was their purpose to acquire an entire right to make use of the whole vestibule connection, such purpose included a design to embrace the Sessions as well as every other patentable feature. It does not impair the legal effect of their acquiescence in the complainants' title to a patent property in the vestibule, that upon the refusal of Mr. Pullman to accede to their wishes, the necessities of their business induced them to take possession of the whole subject-matter of the improvement in train construction, and abide the issue in the courts. It was plain to be seen that the traveling public would never be satisfied in the future with anything less in the way of provision for comfort and safety, and therefore it is in every sense true that the wilful piracy by the defendant emphasizes the strength of the complainants' title. One thing was certain; the public would patronize the line that was equipped with vestibuled cars. It was not under the law punishable as larceny or robbery to capture the improve-



ment for their own profit and advantage. There was enough uncertainty as to the outcome of any remedy asked from the courts to make it possible that some accident would turn in their favor, and thus leave them in possession for a considerable period before a final hearing could be reached, and, therefore, as a business necessity, they proceeded to do that which satisfies in the highest degree the requirement of a chancellor that there shall be a pregnant suggestion of title as evidenced by recognition.

The defendants desire to treat this question as at best only a matter of money damages, but the court will remember that licenses to use such inventions as may exist in the Pullman vestibule are not on sale. It is a fact that not a dollar is charged by the Pullman Palace Car Company to the roads which they equip as a license fee for the use of the Sessions invention. The value of this patent property to the complainant is largely dependent upon the exclusiveness of the enjoyment of the same by the complainant company, and therein resides the irreparable injury which the complainant will sustain in the event that its right is not upheld. The Pullman Company, as well as the Wagner Company, are not merely car constructors; they are operators of car equipment in conjunction with the railroads equipped by them, and the profit which they derive is not based upon an exclusive license fee, but upon the enjoyment by themselves of the property covered by the patents, and from the increased profits derived from the patronage of the public in selecting the accommodations furnished by one company in preference to those furnished by the other.

No one can question that a court of chancery has ample power in its discretion to issue the preventive writ of injunction pending a hearing upon the merits of a case

in the event that good conscience requires this protection to be afforded. Prior to 1862, the rule was very much stricter in its application to the protection of patent properties. A court of chancery would not entertain a bill in equity to repress an infringement unless the title of the patentee had been first vindicated in a court of law. By common consent the justices of the Supreme court recognized the propriety of relaxing this ancient rule, and thereafter actions at law in the federal courts based upon letters patent became the exception rather than the rule. While indeed it is true now, as heretofore, that the party seeking the writ shall show a clear *prima facie* title to his invention, and that the court shall be satisfied that the equity of the case clearly preponderates in his favor, it is not necessary that the court should reach the conclusion in favor of the plaintiff by any particular order or kind of proof. The essential inquiry, I submit, is whether any reasonable doubt has been cast upon the validity of the plaintiff's patent by any showing on the part of the defendant sufficient to impair the effect of the *prima facie* evidence of validity based upon the fact that the patent has issued from the government. If this can be answered in the negative, and if it further appears that the defendant is utterly devoid of any merit in himself, but has been guilty of wilful and deliberate piracy, then every requirement for the exercise of the court's power to grant the writ has been fulfilled.

This general doctrine has been recognized in several cases both in this country and in England, as will be instanced by the following cases:

*Foster v. Crossin*, 23 Fed. Rep., 400;

*Hussey Mfg. Co. v. Deering*, 20 Fed. Rep., 795.

In both these cases the patent had been issued for only a few months.

I have information from Mr. Lee, the senior counsel for the moving party in the case of *Eastman Dry Plate and Film Company v. Anthony*, which case is not reported in the books, that an application was made for an injunction and a restraining order based upon a patent which had just been issued from the Patent Office, under the circumstances where the defendants had obtained from a workman who had left plaintiff's employment sufficient information to enable them to construct a machine like the one patented. The defendant at the hearing purged himself of any intent to infringe, and declared that so soon as he was informed that a patent had issued he gave orders to stop any further progress with the machine. The injunction under these circumstances was denied by Judge Shipman on condition that the defendant would file a stipulation not to infringe upon the patent pending the suit. This case is especially pertinent, for the reason that the validity of the patent was denied, but the circumstances under which the defendant had commenced the manufacture of the machine savored so much of bad purpose as to warrant a binding requirement that the defendant would not use the invention pending the issue of the case. The parallelism between this unreported case and the one now before the court is very striking.

The doctrine on this subject is stated in Kerr on Injunctions, p. 402, in these words:

“ But it is not a matter of course that a patentee should establish his right before applying to the court. If the question as to the validity of the patent be free from doubt and difficulty, or a fair *prima facie* case be made out, the court may inter-

tere, notwithstanding that the patent may be a recent one. *The conduct or admissions of the defendant* may amount to sufficient *prima facie* evidence on which to grant an injunction even in cases where there is a doubt as to the validity of the patent."

Again, Mr. Agnew, in his treatise on the English law relating to patents for inventions, page 312, says, after stating the rule as it is observed in this country:

"But the court has power to grant an injunction to restrain the infringement of a recent patent without requiring the patentee to establish his right, if it appears that such course will do justice between the parties."

The Vice Chancellor in *Gardner v. Broadbent*, 2 Jur., N. S., 1041, says:

"There is no law of this court which prevents a patentee by the recency of his patent from applying for an injunction *ex parte*, and I wish it to be understood that the law of this court is laid down by Lord Eldon in the case of the *Universities of Oxford and Cambridge v. Richardson*."

The same Vice-Chancellor says, in *Clarke v. Ferguson*, 1 Giff., 184:

"It is not a mere matter of course, because a patent is recent, to call on the patentee to establish his rights at law before he can obtain relief in this court; it is in the discretion of the court to require a plaintiff to assert his rights at law, or otherwise, according to the nature of the case."

In this case the injunction was granted in view of the circumstances of the case.

Lord Justice Bruce, in *Renard v. Levinstein*, 10 Law Times, N. S., 177, commented upon the recent grant of a

patent before him, and in denying the motion on other grounds says:

“Its age is no objection to an interlocutory injunction of itself.”

The question has been decided by Judge Wallace in the Grape Sugar cases, 10 Fed. Rep., 836. He remarks:

“Formerly the rule undoubtedly was that a preliminary injunction would not be granted unless the right secured by the patent was fortified by evidence of the exclusive or recognized enjoyment of the right or by former adjudications sustaining it. In more recent practice this rule has been relaxed when the validity of the patent has not been assailed and the proof of infringement is clear. *North v. Crawshaw*, 4 Blatch., 70; *Burleigh Rock Drill Co. v. Loddell*, 1 Bann. & Ard., 635; *Steam Gauge & Lantern Co. v. Miller*, 8 Fed. Rep., 314.”

Judge Walker recognized the same general principle in the case of *Butler v. Ball*, 28 Fed. Rep., 754, when he granted an injunction, under the peculiar circumstances of the case, against a party, prohibiting him from making a structure which was the subject of an application for letters patent which had not issued at the time that the order was applied for.

#### THE SESSIONS IMPROVEMENT.

I am now brought to the inquiry as to what is the subject of invention set forth in the Sessions patent of November 15, 1887. After we understand the subject to which the patent specifically relates, it will be easy to proceed to inquire whether in any alleged anticipatory matter that has been brought before the court on the part of the de-

fendants there is any hint or suggestion of the Sessions improvement.

There is one characteristic of the improvement set forth in the Sessions patent which must be kept in mind throughout the entire discussion, because it is radical, and distinguishes the device or apparatus which he has patented from any prior construction described in any letters patent or existing in the art. That prime character is the employment of frame-plates as they are termed in the patent, or equivalent series of buffers forming a part of the car structure, or, in other words, constituting an extension of the car-body to a point some inches beyond the vertical plane of the end of the car. It is required that these frame-plates shall be

“arranged, as shown in the drawings, at each end of the car, in vertical planes which are parallel, or substantially so, with vertical transverse planes passing through the body of the car, and when the car is detached from a train, these frame-plates will be projected beyond the ends of the car by the influence of backing springs such as are indicated at Fig. 4.”

And again—

“The end to be accomplished is to cause the frame-plates to act as spring buffers whenever cars are being coupled, or whenever a train is suddenly checked or started, and to also act as frictional resistance plates to oppose or counteract the influences which tend to induce a swaying or oscillating movement in the several cars of a train.” (Page 2, lines 5-22.)

In the introduction to the specification the purpose of the invention is stated to be twofold; first, to diminish the racking effect upon the car-body when the apparatus acts as a spring buffer, and “consequently to diminish the

“tendency to a swaying or oscillating movement, which  
 “is developed whenever a train is running at high speed  
 “upon an ordinary railroad track.” (P. 1, lines 25-35.)

In the description of the apparatus the connection of the frame-plates with the car-body by means of strong “rods or bars *c c'*,” attached at one end to the frame-plate at its upper corners, and capable of sliding between keepers bolted to said vestibule extension or to the car-body is pointed out by reference to the drawings, particularly to Fig. 4, where the matter is plainly shown. The lower ends of the frame-plates are shown and described as connected with the main buffer springs arranged underneath the car platform. It is manifest from this description that the frame-plates and the connecting attachments of the same with the car-body constitute an extension of the frame of the car-body itself, and that such extension has no capacity to move sidewise independently of the movement of the body of the car with which the same is connected, for the reason that the frame-plates are held in vertical planes substantially parallel with the vertical transverse planes passing through the body of the car by means of such connecting sliding bars *c c'*, and the attachment at the foot to the main platform buffers.

This characteristic, as I have said, should be kept in mind, because it is in contrast with various prior structures which are designed to enclose the ends of cars, and which are articulated so as to be capable of sidewise movement independent of the sidewise movements of the car-body. One of such instances will be found in the prior patent to Charles S. Smith of October 24, 1882, to which I shall have occasion hereafter to allude.

It is clear from the patent that these frame extensions

of the car-bodies are forced outward by the influence of their top and bottom backing springs to a point several inches beyond the vertical planes which these same frame-plates will occupy when the cars are coupled together. It follows of necessity that the faces of these plates, in contact when the cars are coupled into a train, will press against each other with all the force due to the pressure of their backing springs, and thus the necessary effect of the construction will be.

“to provide a resistance to this tendency to oscillation, by checking the same at the outset before the impulses which produce it have accumulated. The surfaces of the spring-backed frame-plates in contact are capable of resisting all ordinary impulses to oscillation induced by the movement of the train.”

In the same paragraph it is further stated:

“The effect of combining the cars of a train by the aid of frictional surfaces in contact under considerable pressure, such as I have shown, is to dissipate all the lateral movements of each car throughout all the other cars so connected, and thus give steadiness to the whole train. This result will not only greatly facilitate the ease in passing from one car to another, but will enable trains of the same weight and motive power to be run safely and comfortably at higher speeds over the same road-bed than heretofore.”

(P. 2, line 125, to p. 3, line 7.)

I agree with the learned counsel for the defendants that the Sessions patent does not profess to embrace a vestibule enclosure for the ends of cars. It is an apparatus which is of the greatest value and utility when the platforms of cars are enclosed by a vestibule, because it enables a close joint to be made between the abutting ends of cars, which will exclude, to a great degree, dust and snow. But the improvement is capable of being applied,



as the patent states, to railway cars of the ordinary type, not provided with enclosed platforms. It is an apparatus which is capable of accomplishing all the advantages which can be claimed for any previously existing spring buffer. It is distinguishable, as I will presently show, from any prior arrangement of a buffer between the superstructures of cars, in the important circumstance that the adjacent faces of the plates are constantly under opposing spring pressures. The value of this construction, furnishing as it does a spring cushion interposed between car superstructures, is greater than that of any prior device to resist the effect of collisions upon railroads, by maintaining the integrity of the car-bodies. A chief value, however, of the improvement, and the one to which special emphasis is given in the patent, resides in the ability of the device to check those slight tendencies to a tremulous or vibratory movement which are so disagreeable to the passenger when a train is running at high speeds. This subject is set forth fully in the affidavit of Mr. Pullman in the illustration which he draws from the operation of a child's swing, which is capable of falling through large arcs of vibration as the result of a succession of aggregated impulses, each one of which is trifling in its force. Again, it is well known, as the patent states, that "the cars of a train do not generally sway in unison, but "oscillate according to the effect of particular accidents or "influences", and the effect of these friction plates, which are incapable of sidewise movement independently of the car-bodies to which they are attached, is to dissipate these lateral movements throughout the connected cars, and thus give steadiness to the train.

The criticism that the patent does not point out how strong the backing springs should be is sufficiently an-

swered by the statement in the patent that the frame-plates are brought face to face in close frictional contact, and backed by powerful springs, and that the effect of the improvement, as required by the description and the claim, should be such as to furnish a frictional resistance in opposition to the forces which tend to set up vibrations or oscillations in the car-bodies.

The testimony which has been presented in support of the motion can leave no reasonable doubt upon the mind of the court as to the effect of the frame-plates in practical use being all that the patent claims. After making every allowance for the thorough construction of cars in other respects, including the strength of the framing and the proper adjustment of the different parts to each other in the direction of balancing the effect of forces to which a train is exposed in running, there remains a great deal in the way of a tendency to vibrate, which is only corrected by the presence of vertical buffer plates in frictional contact. We have presented a large number of testimonials, under oath, from persons in the community whose intelligence, respectability and freedom from influence will be recognized by this court. It is impossible that these gentlemen, who have volunteered their testimony to the superior comfort of the vestibule train over the best form of train previously known, can be under a delusion. They have been selected for the reason that there could be no suspicion that their testimony was induced by any desire to render a favor to the complainants. It must be a fact when they testify that the movements of a train provided with the Sessions improvement are more steady, comfortable and uniform. The vestibule enclosure makes a passage from one car to the next more comfortable and easy, but it has no effect in giving steadiness of movement

to a train in case the ends of the adjacent cars are not combined together by the Sessions device. When we are told that the lamps of a car are capable of being burned with a higher flame than heretofore, it must be a fact that the vibrations of the car-body have been reduced. When it is testified that the upper berth of a car in a Pullman vestibuled train is rendered more comfortable, and that the occupant can sleep more quietly, because there is less lateral movement, it is at least probable, when we find mechanism designed to accomplish that end, and manifestly embodying the forces capable of bringing about that end.

The testimony of conductors upon the train should not be disregarded because they are the servants of the company, when they tell us that persons afflicted usually with travelling nausea are not so affected when traveling upon a Pullman vestibuled train. This fact is testified to by persons whose nervous organizations subject them to that malady, and therefore the testimony of conductors in that respect is independently confirmed.

Again, it cannot be the mere effect of imagination when the traveler in visiting the dining car, finds that his soup is not thrown into his lap or his wine bottle overturned. Our testimony shows that passenger cars quite as heavy and as well appointed in every respect as those of the vestibuled train were in common use before the vestibuled train came out, and yet it is true that the passengers over the line of the Pennsylvania railroad traveling in such equipment experience discomforts that they do not feel when travelling upon the vestibuled train; and thus I feel that I am justified in saying that the whole body of proof which the complainants have presented, from the conductors in their employ,

from the general and divisional superintendents of railroads, and from passengers of intelligence and respectability, who are able to compare the former order of things with the new, establishes in a conspicuously certain way the practical value and importance of the Sessions appliance.

#### DIFFERENCE BETWEEN THE CONSTRUCTION OF ENGLISH AND AMERICAN RAILWAY CARS.

In this connection it is pertinent that I should direct the attention of the court to the difference between English railway carriages and their combination with their running gear, and American railway coaches in universal use. The matter has a bearing not only upon the importance of the Sessions improvement, but it will also help us to understand presently the prior English devices for ameliorating the effects of a collision which are set forth in several patents of prior date.

The ordinary car in use in England prior to the introduction of Pullman cars into Great Britain consisted of a strong platform, about eighteen or twenty feet in length, upon the under side. At each end are down-hangers, which are furnished with vertical slots, within which axle-boxes are mounted, and through which boxes the carriage axles pass. With the exception of a capacity for vertical movement in such down-hangers, the car-axles are rigidly connected with the platforms. It is intended that such car platforms shall be so short as that the distance between the centers of the axles at each end of the car shall fall within a unit of the curve of the railroad track. The superstructures of English cars have about the strength of Concord stage-coach bodies. The whole

reliance is upon the strength of the platforms which support such bodies. Again, the height of such superstructures is only about seven feet two inches. All this clearly is made to appear in the replying affidavits of the complainant. Now, the American system of constructing railroad cars involves the employment of a car-body from forty to seventy feet in length. It would be impossible for a car-body of this length, if provided with rigid axles at its ends, to follow the curves of any ordinary roadbed. Consequently the car-bodies are mounted upon trucks, which are capable of swiveling, so as to conform to the curvature of the roadbed independently of the car-bodies. Each of these trucks, as is well known, carries from four to eight wheels. Ordinarily in the cars of the complainants and defendants each truck is provided with six wheels, and the distance between the centers of the extreme axles of the wheels of the truck is entirely within the unit of the interior of the curve which would be employed in railroad construction. It needs no argument to establish the fact that a car-body mounted upon trucks, capable of swiveling under the car, has a very much less rigid base support than would be the fact in case the car were only eighteen feet in length and had its running gear practically rigidly connected with the car platform. Again, the height of the American car is three feet in excess of that of an English car. This is for the purpose of accommodating a tier of upper berths, or, in day cars, for airiness and ventilation. It is within the experience of every traveller on railways in this country that a fast-running train over an ordinary roadbed has a tendency to set up vibration. One has only to observe the swaying of the signal cord which runs through a train to appreciate this fact. This oscillatory movement

under ordinary conditions may not be very great, but it is always disagreeable. It interferes with the reading of ordinary print; it produces a general nervous discomfort; to many people of sensitive organization it is a cause of serious inconvenience. Any device which will tend to lessen this cause of discomfort is surely a blessing, but when we consider that the same device which effects this is capable also of preventing in a great degree the maintenance of those larger vibrations of car-bodies which are induced by the curves of a railway track, as well as by the unevenness of the rails, we can understand that there has been added a safety appliance of the highest value.

The swaying movement of cars does not spring into existence at once; it is the result of a succession of impulses which are constantly applied. Each impulse is added to the preceding ones until finally the train takes a curve in an opposite direction, and then the swaying movement is suddenly arrested with a shock, and a new set of oscillations are again engendered to be again arrested with a shock when the train takes a curve in the reverse direction. No one contends that such extreme conditions may not exist as to compel car-bodies to sway, notwithstanding the interposed friction resistance plates. Undoubtedly the weight of a car-body is very great, and its momentum after the swaying motion has been set up is almost irresistible. It is the purpose of the Sessions improvement to diminish these ill effects attending railway travel by a device which checks at the outset the tendency to vibration. It is no answer to the value of this device to say that there are some conditions where the forces creating oscillation are superior to the forces arrayed to check it; the sole question is, does the appliance of Sessions have a tendency to check car oscillations,

and is it operative for that purpose? If the question is answered affirmatively, the utility of the contrivance is settled so far as the law requires to be satisfied.

In this connection I am brought to a consideration which has been advanced by Mr. Payson, and to which, in my view, he attaches altogether too much importance. In the view of the defendants, if I rightly understand them, the presence of frame plates having their faces bearing against each other under the influence of opposing springs, cannot sensibly diminish the tendency of cars to oscillate. I will not here refer to the positive testimony of the witnesses who have testified for the complainants on this subject; I have already done that; but I now refer to the mechanical agencies which are brought into play to prevent or diminish oscillation. In the first place, the feet of the frame in the preferred construction shown in the Sessions patent are combined directly with the powerful platform springs. These springs would ordinarily exert a pressure of from twenty to thirty thousand pounds. Now, the effect of this pressure is felt throughout the whole altitude of the frame-plates. Suppose, for example, the feet of the frame plates were welded fast to the bars which are combined with the platform buffer springs, and that the pressure of such springs at the feet were twenty thousand pounds. It would follow, of course, that a pressure of twenty thousand pounds applied to the top of the frame-plates must be exerted in order to press backward the frame-plate, assuming, of course, that the welded joint maintained its integrity. On the other hand, if the frame-plates so combined with the platform springs were hinged to their rods, so that the frame-plate could be moved backward or forward upon such jointed connection,

then pressure applied to the top of the frame-plate would not influence the spring exerting its force against the feet of the frame, but such pressure would cause the plate to be bent backward away from the vertical line. Now, in fact, these frame-plates are, as we have already seen, combined with the car-body at their tops, so as to form an extensible end of the car framing, by means of rods  $c\ c'$  arranged to slide in keeper guides. Now, it follows, under this arrangement, that the force of the platform springs must be felt to some extent clear to the tops of the frames. In addition, however, there are the special top springs which are capable of exerting a pressure of many hundred pounds, which rapidly increases in proportion as the backing springs are under compression. The defendants have omitted, in their discussion upon this subject, to consider the favorable point at which the pressure is applied by the Sessions top springs. When we keep in mind the fact that the car-body is mounted on trucks, we can readily imagine that if there were a lever of sufficient length extending upward in a vertical direction, say to the height of forty feet, it would be within the capacity of the unaided power of a single strong man grasping the upper end of the lever to resist almost any force that would tend to induce an oscillation in the car-body. Of the same kind in character is the force which the springs exert upon the vertical frame-plates. We already understand that each frame-plate constitutes a part of the car-body extended, and partakes of all the movements side-wise of such car-body. We also know from our common experience that the cars of a train do not as a rule oscillate in unison, but quite ordinarily through opposite arcs, depending always upon the accidents of the situation. Now, let us suppose that a car provided with a Sessions frame-



plate exhibits a disposition to oscillate toward the right, and at the same time, for other reasons, the adjacent car, also provided with a frame-plate, has a tendency to vibrate toward the left. So long as the frame-plates are in contact as to their faces under opposing spring pressures, is it not certain, as a mechanical proposition, that the opposite tendencies of the two cars will be wholly or partially neutralized by the effect of such spring-backed surfaces rubbing against each other? It is easy to understand that even a comparatively light pressure upon the tops of the frame-plates, entirely within that degree of pressure which the proof in this case shows is practically employed in both the complainants' and the defendants' cars, would have the effect at least to destroy or to check that tremulous vibratory movement which does not require a large arc of movement or any very great force to engender.

In support of the defendants' line of reasoning in the direction of endeavoring to establish that the whole prevention of oscillation is due to the main platform springs, and not to any spring pressure applied to the frame-plates, resort is had to the theory that friction does not depend on the area of the surfaces in contact, but wholly on the character of the surfaces and the force with which they are pressed together. Now, this law, while in a sense correct, is nevertheless in its practical application a deception. Some twenty years ago a series of experiments were made, with a view of determining whether friction depended upon area or upon the character of the surface and the force by which the surfaces in contact were pressed together. Accordingly a base metal surface was prepared and made as smooth as mechanical tools could make it. All roughness of the surface was

removed by polishing such surface to the last degree of practical possibility. Then two other metallic bodies of the same weight, but having different areas of surface, were smoothed and polished to the same perfection, and from the result of the experiments the law stated was deduced; or, in other words, when the base plate was tilted at an angle the two metallic bodies in contact therewith, with their surfaces smoothed and polished, but of different areas of surface, would rest stationary at the same angle of repose. By this experiment it will be observed that the great factor in producing friction was absolutely removed, and all that was left was weight and area of surface. It is within the knowledge of every one that the friction between two surfaces in a given case of equal pressures is affected wholly by the character of the surfaces. The protuberances upon the surface of one of the bodies in contact may be supposed to fit into the depressions in the fellow body with which it is in contact. Just in proportion as these prominences and depressions are numerous, so is increased the obstacles in the way of moving the one surface over the other. Theoretically, the point of a pin, when pressed against a surface with a pressure of a thousand pounds in the line of its axis, would induce just as much friction as if there were a block of a million pins aggregated together and bearing by the same pressure upon a similar surface. Theoretically, a man in crossing an icy slope with a single hob-nail projecting from the sole of his shoe would be as safely sustained on his feet as if the whole sole of his foot bristled with hob-nails. Practically, we know that the contrary is the fact, and yet the scientific law as formulated is correct, although when applied as illustrated it becomes an absurdity. It is true, indeed, that if the op-

posing pressures on two Sessions frame-plates equals the algebraic sign of  $x$ , the same pressure, if applied to the points of two needles in contact, would cause their points to bear against each other with the same force. When, however, we have to do with roughened surfaces, or surfaces which have a multitude of small prominences entering into depressions in the fellow-bearing surface, the whole conditions are changed, so far as ability is concerned, of one surface to move over its fellow-surface. A new factor comes into play, which is the capacity of the surfaces in contact to resist strains in the direction of moving one surface over the other surface. To illustrate the subject, suppose that a pointed rod half an inch in diameter bore against the Sessions frame-plate and entered a depression therein, and suppose that the pressure upon the rod is exactly what the pressure may be supposed to be upon the fellow frame-plate whose place it takes. Now, the pressure in a direct line is the same when transmitted through the rod as when transmitted through a frame-plate, but if we undertake to move the pointed rod over the surface of the frame-plate we are resisted at once by the opposition which the walls of the depression in the plate into which the pointed end of the rod enters affords. Surely, if we conceive of two Sessions frame-plates, one of which is furnished with ten thousand conical depressions in its surface, and the other frame-plate has ten thousand pointed bosses, so that each pointed boss on the one plate will have a depression in the fellow-plate to enter, the resistance which such plates constituting a part of car-body frames would furnish against the movements of the surfaces over each other would be ten thousand times greater than the resistance which would be furnished by a sin-

gle conical point entering a single depression, and yet the pressures upon the two surfaces in contact would be the same, and the law as formulated would still be true, but have no application in the case supposed. Two Sessions frame-plates are analogous in their character to the illustration above given. The surfaces are not smooth; their extent of area furnishes opportunity for a great number of elevations on the one to enter depressions on the other, and thus oppose any movement of their surfaces over each other, partly as the result of the spring pressure applied to hold such surfaces in contact, and partly as the result of the interlocking of their surfaces with each other, due to the number of points on either which can enter depressions in the other, and thus mechanically interpose an obstacle which is not scientifically "friction," but a positive physical resistance.

It is a well-known fact that a wide belt will transmit more power than a narrow one. Now, if the law that friction depends upon pressure and character of surface, and not upon area, is true in the sense in which the defendants seek to apply it, it would follow that a belt one inch in width would transmit as much power as a belt ten inches in width, provided the pressure upon the driving pulley were the same. Mr. Sessions has treated of this matter in his affidavit, to which I respectfully refer the attention of the court. It is a matter of common knowledge that a belt will slip upon a machine on account of its inability to transmit the power. It will be capable of exerting a greater driving force in case the belt be tightened, but this has the effect to unduly wear the bearings of the shaft. Consequently the remedy is, in such a case, to apply a wider belt, without straining the pulley bearings. The reason why the wide belt will exert a greater driving

power is the same in principle as in the illustration previously given. Other factors and forces beside mere friction are brought into play.

#### THE DEFENDANT'S INFRINGEMENT.

Understanding that the characteristic feature of invention set forth in the Sessions patent is that the car-body shall be provided with a frame-shaped plate arranged in a vertical plane substantially parallel with a vertical transverse plane passing through the car-body, and projected by means of powerful backing springs for a distance beyond the extreme end of the car, so that, upon the coupling of two cars the pressing-out springs of the frame-plates shall become compressed, and, exerting their pressure upon the plates, cause frictional surfaces substantially of the height of the car-body to continue constantly in contact, whereby, in addition to other advantages, there will be created a resistance to oppose the tendency of the cars to sway laterally when in motion; keeping also in mind that these frame-plates are combined with the car-bodies by means of sliding connections, so that, while they have a moment in the direction of the length of the car, they are prevented from having any sidewise movement independent of the movement of the car-bodies, and thus constituting a frame extension of the car superstructure, it is now proper to turn to an examination of the vestibule additions which have been applied by the defendants to their cars, in order to ascertain whether it is not true that there has been a direct and complete appropriation of the Sessions improvement.

It is apparent at a glance that the whole vestibule addition has been taken. It is difficult to distinguish one train

from the other. The general appearance of the vestibule additions, the arrangement of doors and entrance steps, the domed lantern in the roof to light the entrance, have all been copied. This is important, perhaps, only as showing the motive and purpose of the defendants. It is consistent with their entire conduct. The patent in suit does not relate to the vestibule as a whole, but to a component of the vestibule, or an appliance which can with great advantage be used in combination with the vestibule, or can be employed in the event that the platforms are not enclosed. It is clear that a heavy frame-plate is used by the defendants, and that this plate is combined with the car-body so as to have a longitudinal movement, but to be incapable of sidewise movement. It is connected at the top with the car by means of strong rods or bars attached to the frame-plate at one end, and combined with the car-body by means of guides within which such rods can slide.

The frame-plate at the foot is combined directly with the main platform buffer spring, substantially in the same way as the arrangement shown in the Sessions patent. The only formal difference that can be found in the two organizations is the immaterial one that the defendants have inserted a strong elliptic spring to press outward the frame-plate at the top, instead of employing two separate coiled springs. The effect of this elliptic spring is necessarily to force outward the frame-plate with all the force which is due to the spring. At the same time, notwithstanding that such spring is made fast to the frame-plate and to the framing at points near the center of the spring, the frame-plate itself is incapable of any sidewise movement independently of the car-body, on account of the presence of the sliding rods attached to the corners of the frame-plate, as well as the attachment at

the foot of the buffer springs. It is immaterial whether the elliptic spring of the defendants is as powerful as the two coiled springs of the plaintiff, or not. It is apparent, on the slightest examination, that the powerful buffer springs at the foot of the frame-plate exert their influence, whatever it may be, to force the frame-plate outward, precisely the same as in the Pullman construction. It is also apparent that the full power of the elliptic spring operates, in addition, to force outward the top of the frame-plate, and that such force is applied under the most favorable conditions for opposing a tendency in the cars to oscillate.

The testimony of Mr. Sessions on the question of the strength of the spring in the practical structure which the defendants have made and are operating, is clearly set forth in his affidavit. He says that his own physical strength, aided by that of two other strong men, was unable to compress the friction plates in the defendants' cars, notwithstanding that their united force, exerted by bracing themselves, was applied at a point not farther than a foot from the end of the top edge of the plate; and he declares that the united efforts of the three failed to produce the slightest impression, or induce the slightest movement in three of the plates upon which they exerted their strength. The spring which pressed out the fourth plate was somewhat weaker, but they were unable to move it for a distance exceeding the fourth of an inch. Mr. Sessions declares that the pressure upon the lower portion of the plate in the defendants' structure is not less than eighteen thousand pounds, and that at the top of the plates is not less than four hundred pounds. Mr. Sessions further says that the face-plates in the defendants' cars bore evidence of wear from frictional contact with each other, and that

in fact they showed as much evidence of wear during the short time that they have been in operation, as is exhibited by the plates on the vestibuled train which have been in use for several months.

A point is made in argument by Brother Payson that the model of the defendants' cars which has been constructed to an exact scale illustrates that the frame-plates are incapable of preventing oscillation. To this I reply that the model is built on a scale of one-twelfth the size of the full structure. The plates are only one-twelfth the thickness of those in use. It does not follow, however, that the model weighs only one-twelfth the weight of a full-sized car. A child could overturn this model; twelve children could not overturn a full-sized car. In the model the effect of mass is eliminated. An elliptic spring one-twelfth the size of the actual spring can be easily compressed between the thumb and forefinger, but twelve times that degree of pressure would not make the slightest impression upon the full sized-spring. This fact is so elemental and obvious that it is only necessary to state it.

I cannot consider it necessary for me to dwell longer upon the patent fact that the defendants have clearly made use in their cars of the Sessions construction, and that the only departure in arrangement is confined entirely to the substitution of a heavy elliptic spring in place of two individual coiled springs. It is manifest, however, that the elliptic spring performs the same kind of office, and for the same end, which is performed by the coiled springs of the Sessions device.

Several of the cars which belong to the defendants' equipment were constructed by the Pullman Company for use on their line. They are of the best known form of



construction at the time that they were built. It never entered into the mind of any man that it was possible to put a barber shop into one of these cars until after the vestibule train had been constructed and this novelty introduced, but the defendants hastened to apply to these cars the vestibule addition and the Sessions appliance to prevent oscillation, and straightway set up their barber shop. Moreover, Mr. Pullman coined an adjective descriptive of his train, and by that name it has been known and advertised. The defendants, immediately upon putting their train into service, advertised it as a vestibule train both in the public prints and in the folders which they distributed to attract attention to their new departure.

#### THE PRIOR PATENTS THAT HAVE BEEN SET UP.

I ask now your Honors' consideration of the several prior subjects which have been presented by the defendants as tending either to belittle the invention set forth in the Sessions patent, or to have the effect of substantially anticipating it. A brief consideration of each one of the different devices described in prior patents will clearly show that the subject-matter which distinguishes the Sessions improvement is not to be found in any one, or in all of them put together. I shall confine my attention to these patents and prior subjects, which are referred to by Mr. Payson in his argument, as possessing importance in his estimation, and deem it unnecessary to consider the many other patents which are set up in the answer upon which no especial point is laid by the defendants themselves.

So far as all those prior devices are concerned which consist in the employment of platform buffers of various

kinds, or, in other words, buffers under opposing spring pressures applied in planes substantially coinciding with the main platforms of car-bodies, I have only to say that they contain no suggestion of the Sessions improvement. Especially is this true in the case of cars mounted on trucks according to the American system. The effect of such buffers is indeed to ameliorate the effects of a collision, and undoubtedly to the extent to which in use their faces bear against each other in frictional contact they have a tendency to diminish the oscillations of the platforms. But it must always be remembered that the car bodies in use on American railways are not rigidly attached to the trucks, but are combined with those trucks by means of pintles, in order to enable the trucks to sway freely underneath the car bodies. Now, while it may be admitted that the effect of such buffers is in the direction of opposition to the tendency to oscillation, it is at the same time clear that the force in that direction is applied at the most disadvantageous point. It is substantially in the plane which coincides with the axis upon which the car oscillates, instead of being applied at a point or points elevated above such axis, whereby the powerful factor of leverage comes into play to co-operate with any spring pressure applied at such points.

#### THE SIMONS ENGLISH PATENT, JUNE 15, 1847.

In this patent the improvement is shown as applied to an English railway train in which, as before explained, the platforms are combined substantially rigidly with the running-gear. The object of the improvement which has any connection with the present question is as set forth in the fourteenth division of the specification.

This improvement is the application of what the patentee calls "outer buffers," to distinguish them from the main buffers placed in the line of the platforms "so that in case of a violent shock or pressure of the carriages, etc., upon each other, or in case of a collision, *such top buffers may come in contact with, and press upon, each other.*" The thing that was to be prevented was the tendency of these short English cars to rear up on their hind wheels and tumble over upon each other in case of a collision. It was not designed or intended that these top buffers should be in contact at all under ordinary conditions so as to exert spring pressure upon each other to prevent oscillation. This is manifest from the shape of the faces of the buffers, which are in the form of sections of spheres, and, while they would be operative, when brought together in case of a collision, to prevent the cars from rising on their hind axles, such form of buffer would be absolutely impracticable for use as a means for preventing oscillation. Moreover, there is another reason why there could not practically be applied to English railway carriages any system of upper buffers in constant frictional contact. This is set out very plainly in the affidavit of Mr. A. B. Pullman and others. The superstructures of English carriages are about the strength of the ordinary well-known Concord coaches. They are not intended to bear pressure except under extraordinary circumstances. Finally, there is no suggestion whatsoever in the specification that the top buffers of the Simons patent were to perform any other office or effect than to come in contact with, and press upon each other whenever a collision or sudden arresting of the movement of the train caused the lower platform buffers to be so far compressed, as the result of such collision, as

to bring into contact the faces of the upper buffers, and thus present a practical obstacle to the rearing upward of the cars of a train.

Reference is made in this patent to means for preventing the oscillations of the carriages. This shows plainly that from a very early period, means and devices were sought for to prevent such disagreeable effects. The mode, however, of accomplishing it in this patent is not the Sessions mode of interposing a vertical buffer between two railroad carriages, extending from the platform vertically upward to a point near the tops of the carriages, but it consists simply in substituting for a single pair of buffers applied at the center of the platform two pairs of buffers applied to the platform, but near its outer edges. Undoubtedly, the employment of two buffers spread apart so as to occupy a base line approximating closely to the width of the platform, would have a tendency to prevent oscillation in an English carriage beyond what would be accomplished by a single pair of buffers placed in line and applied at the middle longitudinal line of the carriages, and if the carriage be only eighteen or twenty feet in length, and be rigidly connected with the running gear, and be of a height no greater than about seven feet, two inches, undoubtedly this device would practically fulfill reasonable requirements. (Affidavit of David J. Powers, pp. 127-132.)

ENGLISH LETTERS PATENT TO W. AND G. RICHARDSON, OCTOBER 5, 1857.

This patent is for the same subject exactly as the prior patent to Simons. (Affidavit of David J. Powers, pp. 132, 133.)

## ENGLISH PATENT TO GEORGE DYER, OCTOBER 6, 1863.

The invention set forth in this patent is substantially the same as that set forth in the prior patents considered. The difficulty to be remedied, is, the toppling over of the carriages upon each other in the event of a collision. The remedy applied was the application of upper buffers, which are not described to be in constant contact to prevent oscillation, but are only to come into play in the event of a collision or sudden stoppage of the train. This is clear, from the fact that the patentee says that the "play of the upper buffers shall be about one-half of the lower set." This would naturally follow. The lower set of buffers have their springs compressed as a result of an obstacle in the way of the movement of the train, whereupon the upper buffers are brought into contact, and their springs have a less extent of play than the lower set of buffers. Oscillation is not prevented in the slightest degree as the result of the employment of the upper buffers, and if it were intended that their faces should be in contact, it would follow of necessity that the play of the springs would be required to be as great as the play of the lower set of springs.

This patentee understood that it was desirable to provide some means to prevent oscillation, but his plan was not the employment of friction surfaces in constant contact to accomplish that end, but he proposed to increase the diameter of the wheels of the running gear to about five feet and higher, to be equal to the base of breadth of the car, so as "to resist the overhanging weight or tendency to turn over and to give greater steadiness to the motions of the carriage generally." The buffer in this case had its head in the form of a section of a sphere, which is the

common form of buffers employed on English railroads. The object of this spherical form doubtless was to enable the train to easily round curves without inducing that rigidity which would result to a certain extent in the event that the faces of the buffers were flat planes. (Affidavit of David J. Powers, pp. 133-136.)

ENGLISH PATENT TO ROCK CHIDLEY, JANUARY 11, 1865.

The whole device in this patent consists in the employment of two rods near each side of the car, which are similar to rods for supporting curtains. It was intended that the platforms should be enclosed by means of a curtain, and the rods were to give support to the same. The ends of each of these rods were provided with a light spiral spring which took a bearing against the adjacent car, and the purpose of this was to compensate for the lengthening and shortening of the distances between cars in rounding curves. The spring in fact served the purpose substantially of lazy tongs, and is a device very analogous to the lazy-tongs gates or guards used on the elevated railroads in the city of New York.

(Affidavit of David J. Powers, pp. 136, 137.)

ENGLISH LETTERS PATENT TO MICHAEL ANGELO GARVEY.

This patent was not presented to our notice until the argument. It is not made the subject of discussion by the experts upon either side. It is perfectly easy, however, to comprehend its true import, and I have had an illustrative model made which will perfectly exhibit its action. In one sense it is more important than any other

patent which has been introduced by the defendants, not because it serves in any degree to weaken or to impair the Sessions combination, but because it shows plainly, that the fact that oscillation exists in railway trains has been recognized and sought to be prevented for a long period of time. In English railway carriages, as we already have seen, this disagreeable concomitant of railway travel is by no means so serious as in the case of American railway trains, and for the reason, as already explained, that the carriages of English railways are in a measure rigidly combined with the running gear, while American carriages are usually three times and a half the length of an English car, are three feet higher, and are mounted upon trucks upon which they can sway. Moreover, the top hamper of an American car, especially if used for sleeping-car purposes, is vastly greater than anything that can be found in an English carriage, especially when the upper berths are occupied, and the incidental weight elevated so high above the point of oscillation. And yet, the disadvantages of oscillation were recognized in English carriages, and means were devised for diminishing it.

The plan proposed by Garvey was to employ what may be very properly called a frame-plate extending beyond the ends of each of the cars. This plate was attached in a peculiar way to sliding bars, but such plate was not rigidly attached to such bars so as to constitute an extension of the railway carriage. These plates were faced with felt, and were not intended to slide on each other as the frictional surfaces in contact of the Sessions plates are intended to move over each other, but it was designed that they should be held in fast contact with each other. Moreover, inasmuch as the sliding rods which

combined them with the car-bodies were not rigidly attached to such plates, but were combined with them by means of volute springs, it is manifest that the plates would not, as the Sessions plate must necessarily do, partake of the movements laterally of the railway carriages. The purposes of the volute springs was to interpose a spring resistance to the lateral movement of the car-bodies and the rods (as distinguished from rods and frame-plates) connected therewith. Consequently, when a railway carriage swayed, the rods combined with such carriages would partake of the same movement. The plates, however, did not; they remained in contact with each other, and the tendency to sidewise movement of the carriages was resisted by the volute springs. This device undoubtedly possessed efficiency. It is not practical for adoption to the American carriage, on account of its complexity and its unsuitableness in case there be required a continuous passage from car to car. It bears no relation, however, to the Session invention, except in the general and immaterial matter that it proposes to interpose a resistance to the tendency of cars to oscillate. It is not the device at all of the Sessions patent. In the Sessions construction, reliance is had upon an altogether different set of forces and a different combination of operative devices. The plates which are to be in contact are held, in the Sessions device, in that relation under powerful opposing pressures. The purpose is to develop frictional resistance. Unlike the Garvey plates, they are made fast to the sliding rods and main buffer devices which connect them with the car and compel such frame-plates to be substantially integral with the car-bodies; or, in other words, a frame-like extension of the car-bodies. When a car provided with the Sessions appliance commences to sway,



the frictional contact of the surface of its frame-plate with the fellow frame-plate of the next adjacent car, presents a hindrance to such oscillation, and which is measured by the extent of the surfaces and the character of the surfaces in contact, and the degree of spring pressure. Again, there is another marked difference in the operation of these two devices which needs only to be stated to be appreciated. In the Garvey structure the resisting power is a constant; it is the measure simply of the power of the volute springs. In the Sessions organization, however, the force which is applied to press the frame-plates together, and thus increase the degree of frictional resistance, is not an absolute constant. True, the direct pressure of the top and bottom springs is a constant quantity which is never lessened, but when the train is suddenly checked as the result of a collision, or from a sudden application of the brakes, the cars of the train press or crowd upon each other, and then the power, with the spring pressure which is applied to the frame-plates, is greatly increased. Now, exactly the same thing is true when a train is running over an ordinarily crooked roadbed. It is just at that time that there is a tendency on the part of the train to set up the greatest degree of oscillation. The locomotive and the baggage-car enter upon the curve sooner than the rest of the train. The necessary tendency is to check the movement of the locomotive and baggage-car, because the resistance to the locomotive is increased when it enters upon the curve. The momentum of the remaining cars in the train causes them to press forward upon each other, and thus the factor of constant pressure in the Sessions device is greatly increased on the frame-plates as the result of these conditions. Now this is an advantage which can come only from the employment of

that device or combination of means which is expressed in the Sessions patent as the combination with the end of a railway car of a frame-plate or its equivalent, backed by springs, arranged with its face in a vertical plane, and normally projecting beyond the end of the cars, whereby, upon the coupling of two cars, not only will a spring buffer be interposed between the superstructures of such adjacent cars above their platform, but also frictional surfaces under opposing spring pressures, to prevent the racking of the car-frames and to oppose the tendency of the cars to sway laterally when in motion.

A marked characteristic of the Garvey structure is expressed in the peculiar name which he gave to his device. He called it a "spondyloyd." This means that it was an articulated connection, and that was precisely its characteristic. The articulation was effected by means of volute springs, and the patentee runs the parallel between the spinal cord in the human frame encased within the vertebræ of the spinal column and his spondyloyd train enclosing passengers. The grand characteristic of the Sessions appliance is that it does not belong to the order of vertebrated animals, and in that respect is in marked contrast with the Smith construction and others of that type presently to be introduced.

I conclude this branch of the discussion, which embraces all of the prior English patents which are of the least importance, with the repetition of the statement that none of them contains the least hint or suggestion of the Sessions organization. It is also, in this connection, worth remembering that the Pullman Company are at present engaged in the construction of a train of vestibuled cars for use on the London, South Coast and Brighton Railway in England. Up to this time it does not appear, at

least, that English railway managers regard the vestibule improvement either as of little consequence or as old in the art.

THE CHARLES S. SMITH PATENT, OCTOBER 24, 1882.

This is an American patent which is owned by the Pullman Company. It illustrates one of the several devices which had been used or experimented with at different times for the purpose of enclosing the ends of railway carriages so as to make a continuous passage-way between adjacent cars and to render the passage from car to car more easy and comfortable. It is essentially a "spondylojd" attachment. It consists of a number of bows, like the bows of a carriage, which serve to give support to some flexible material, like canvas, so as to form a hood or enclosure of the platform. These ribs are stated to be "light ribs or frame-pieces," to which the flexible material is secured. The ends of two bows in contact are preferably covered with some backing material so as to make a tight joint and prevent the access of cinders, and it is also suggested in the specification that springs may be arranged in the sides of the hoods so that their faces may be forced and held against each other, but this is stated to be usually not necessary. There is not the slightest suggestion in the specification that this appliance would have any tendency whatsoever to interpose any resistance to the tendency of cars to oscillate. The absence of any such statement is due to the fact that it was designed and intended that this connecting hood or canopy should be an articulated structure, and should be free to have a lateral movement in itself independently of the movement of the car bodies. In order to con-

vert it into a Sessions structure, it is necessary that the front bows, which are intended to abut against each other, should be connected at the top and bottom with the car-bodies by a rigid connection, which would compel such bows or frames to partake of the movements of the car-body. Then, if the surfaces in contact and the springs which press them outward were capable of developing frictional resistance, there would be embodied the Sessions improvement. It is plain, however, from a reading of the Smith specification and an inspection of the drawings, that no such contrivance entered into the mind of the patentee. The whole end which he sought to accomplish was to apply a canvas or flexible jointed connection between the ends of railway cars which would enable such cars to be furnished with an inclosed passageway between their ends, but which would interpose the least possible resistance to the free movement of the cars both in rounding curves and in oscillating. There is a wide difference, as the court will recognize, between the attachment of frame plates serving to make a connection between the adjacent ends of cars which are attached to flexible material, so as to be in every sense articulated, and frame plates which are attached to car-bodies so as to form extensions of such bodies. In the one case, frictional contact between such frame-plates opposes a tendency to oscillation on the part of the cars; in the other case, the frame-plates present not the least obstacle to an oscillatory tendency on the part of the car-bodies.

#### THE DEFENDANT'S MODEL OF THE SMITH PATENT.

I cannot too emphatically condemn the model which has been presented by the defendants of the Smith patent.

The thing that they show is substantially a model of the Sessions improvement. It is in no sense a true model of the Smith device, and the court will not be deceived by it. Instead of being a spondyloid, or articulated appliance, it is represented in the model as combined with the car-body by means of sliding rods forced outward by springs. It is the very opposite of the Smith structure. The misrepresentation is too gross and flagrant to cause any apprehension as to its misleading the court.

#### THE HOOD-FRAMES OF THE MICHIGAN CENTRAL RAIL-ROAD.

This device has not been employed for many years. It was intended to furnish a light frame to support a hood or canopy to prevent cinders from the locomotive falling upon the platform. The complainants have in their possession, and have made an exhibit in this case, one of these old canopy structures, and which is open to the inspection of the court. The character of the device is shown in the testimony of A. Longstreet, page 154; W. H. Fry, page 158, and H. H. Sessions, page 163. The device consisted of a light board about one inch in thickness and three or four inches in width. It was uniformly curved to correspond generally with the curvature of the roof of the car. It was supported by four rods at right angles, with its face near the roof of the car, and these rods were provided with light springs of about No. 11 wire, a sample of which we have produced, and which would operate to press these frames outward so that two adjacent frames would meet at the transverse middle line of the space between two cars. This frame supported a canvas canopy, and the only purpose and object of the framework was to

extend or to stretch such canopy. The faces of these boards were covered with thin sheet iron. This device, as I have already said, has been abandoned for many years. No one has the hardihood to testify that it was ever designed or intended to exert any frictional resistance to effect the steadiness of a train. It is manifest that no such idea was present in the mind of any constructor, for the reason that no provision whatsoever is made for taking up the strain which would result in case the springs were of sufficient strength and the face boards of proper material to act as spring buffers. The roofs of the cars would have been pried off in the event that the device, as we find it, had ever been constructed with a capacity to act as spring buffers under constantly opposing pressures sufficient to diminish oscillatory movements. One can idealize, of course, this structure by pointing out that it was only necessary to conceive the idea of using a top buffer, and then convert this canopy frame into such a device by endowing it with new properties as the result of an entire reorganization of its members. It is an instance, doubtless, of two frames having face pieces which are held extended by means of springs so as to meet and give support to a canopy. The elements which enter into such organization may indeed be said to be the same elements which would enter into an elevated buffer; that is to say, there are two face boards, rods connecting such boards with the car, and springs to press them outwards; but the device is not a buffer, nor has it the capacities to develop frictional resistance to oscillation. When it is converted into such a device it is not the former device, nor does it differ from the former device simply in degree—it is a difference in kind. In useful inventions the difference between the new thing and those things which preceded is

frequently a difference in mere form, proportions and arrangement. The Supreme court have recognized this in the case of *Loom Co. v. Higgins*, 105 U. S., 591, in which they reply to a former structure in a loom which was claimed to deprive the thing patented of any patentable quality, by the language:

“This argument would be sound if the combination claimed by Webster was an obvious one for attaining the advantages proposed—one which would occur to any mechanic skilled in the art. But it is plain from the evidence, and from the very fact that it was not sooner adopted and used, that it did not, for years, occur in this light to even the most skillful persons. It may have been under their very eyes, they may almost be said to have stumbled over it; but they certainly failed to see it, to estimate its value, and to bring it into notice. Who *was* the first to see it, to understand its value, to give it shape and form, to bring it into notice and urge its adoption, is a question to which we shall shortly give our attention.”

The same line of reasoning runs through the opinion of the Supreme court in *Consolidated Valve Company v. Crosby Valve Company*, 113 U. S., 157. In this case there was put in evidence various English patents of long prior date which contained the same elements as the plaintiff's device, and in the same combination. The difference between the thing patented and these prior structures resided in the presence of a retarding structure for the escape of steam from a safety valve, so that the passage for the entrance of steam into a supplementary, or huddling chamber, was always larger than the area of exit. The result, in the opinion of the court, was that the old organization for safety purposes had been reorganized by the patentee so as to accomplish in that regard all that

the previous structures did, and, in addition, accomplish an improved economy of operation. In speaking of these patents the court remarks (p. 170):

“In regard to all of the above patents, adduced against Richardson’s patent of 1866, it may be generally said, that they never were, in their day, and before the date of that patent, or of Richardson’s invention, known or recognized as producing any such result as his apparatus of that patent produces, as above defined. Likenesses in them, in physical structure, to the apparatus of Richardson, in important particulars, may be pointed out, but it is only as the anatomy of a corpse resembles that of the living being. The prior structures never effected the kind of result attained by Richardson’s apparatus, because they lacked the thing which gave success.”

I have thus reviewed every one of the prior devices upon which any reliance has been placed by the defendants to defeat the present motion. When they are viewed individually and collectively, can an impartial mind consider that they impair in the slightest degree the validity of that combination which is the subject of the Sessions patent which the public have so universally recognized and which the defendants were so quick to seize?

The argument on the part of the defendants, that the public would be interfered with, and they put to great expense, in the event that they are enjoined from using the Sessions device, can be answered in a few words. They are at liberty to use a spongy connection between the ends of their cars, and they will then have substantially the articulated organization of the Russian royal train. Or, if they desire to retain the ponderous frame-plates which are so important in the Sessions frictional contact system, let them move them backward so as to be within the planes of the ends of the cars, and then they cannot



have their surfaces bear against each other under opposing spring pressures, to diminish the effects of oscillation.

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There is only one further consideration, and I conclude. I did not advert to it in the oral argument in a crowded court-room, for the reason that it would savor too much of that appeal to the multitude in favor of a client, which would be more fitting for a public gathering than for the forum of a court of justice. I do not hesitate, however, to state myself in type before your Honors.

An attempt has been made in the defendants' affidavits to belittle and cast a sneer at Mr. Pullman. He is represented in the light of one who is claiming for himself improvements which do not belong to him, and which possess in themselves no mechanical value, but have been rendered attractive by the garb in which they have been put. The whole line of the discussion on the part of the defendants has been in the direction of belittling, as far as possible, the present invention, to the end, I suppose, that your Honors may be induced not to interfere at this stage of the controversy, but allow the defendants to reap the benefits of their piracy until a final hearing upon full proofs can be reached. I have said all that I deem to be necessary upon the technical point thus raised. I now wish only to repel the unworthy aspersion which the tone of the defendants' affidavit seeks to cast against Mr. Pullman as the representative and head of the complainant company.

All the world knows that Mr. Pullman is the creator of the sleeping-car in its highest form of development. All prior structures have passed away and been forgotten. The Pullman folding upper berth has made these cars not

only comfortable for passengers, but economical in use, by providing accommodations for as many persons with beds at night as could be reasonably made comfortable with sittings by day. This improvement was appropriated by the predecessors of the defendant company, and they paid heavy damages therefor. It is not, however, upon the benefits which Mr. Pullman has rendered to the whole civilized world in sleeping-car accommodations that his just fame will rest. His chief glory is the institution of the model city which bears his name, and which is a living exponent of the practical solution of one of the great problems of civilization. He has taught the world a lesson in social science, the influence of which will be enduring, and will in time leaven the whole empire of the State of Illinois. He has taught the world that there is no necessary antagonism between labor and capital, at the same time that he is elevating, by a clear law of evolution, the capacity of the servant into the intelligence of the master. Above all, he has proved that by the right application of the essential spirit of the scriptures, a new reading can be given to the text, that a man cannot serve both God and mammon. By the stimulation of social order and the practice of virtue, with the encouragement of industry, he has aided in the largest way the maintenance of that system of law of his country, whose aid, as a suitor against a wrong done to his interests, he now invokes. By his work, unparalleled in the history of a private citizen, he has performed the labors which in the world's history have hitherto been accomplished by the imperial power of emperors and kings. Such men have a right, in the presence of those who have taken another's property, and then offered the insult of a nominal consideration to escape prosecution, to assert themselves with force and dignity.

The defendants may paint their names upon their vested train; they cannot change the truth that it originated with Mr. Pullman and was the outgrowth of his large conceptions. If they desire to still further imitate his works, let them, with their means and resources, convert a barren waste on the prairie into an orderly city for twenty thousand happy human beings, surrounded by every blessing of modern civilization and every appliance for the development of the physical, the moral, and the intellectual faculties; and then the foremost among them will be entitled at death to have erected in the marketplace of that city, not a statue in bronze or marble, but a simple plate inscribed with a single name, with no date of death—for such men never die—but with a line fitly borrowed from the inscription under the tablet of the great architect of the Cathedral of St. Paul—“ *Si desiris monumentum circumspecte.*”



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